



Astrophysics
Division

NASA Advisory Council Astrophysics Subcommittee: Research, Analysis and Enabling Technology Programs

16 February 2011

Linda Sparke
Research Program Manager
Astrophysics Division



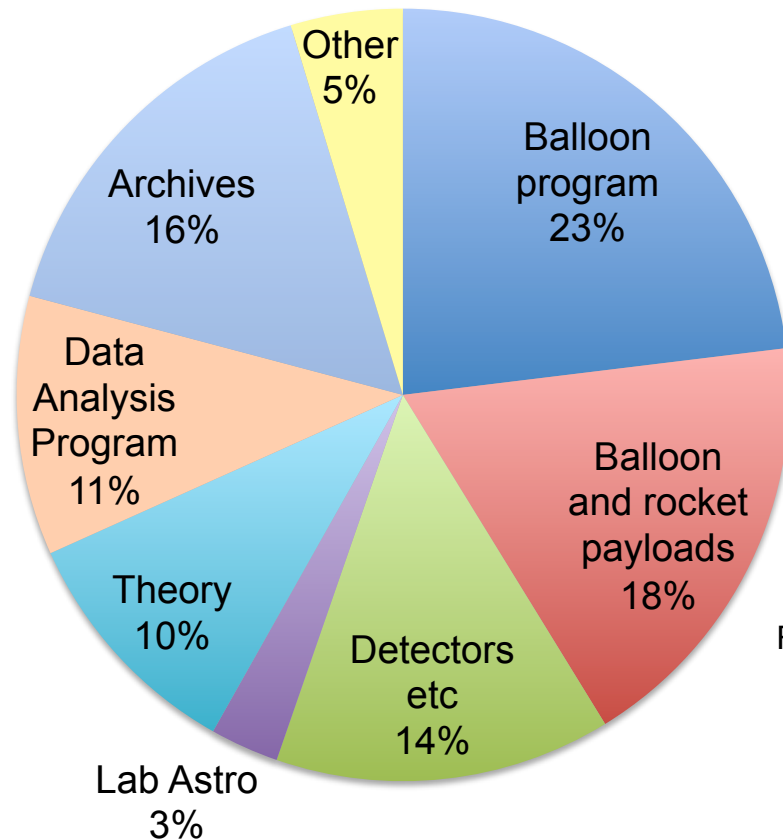
Statistics for ROSES competitions

Program Element	Due Date	Notification	Days	Received	Selected	Success	Δ
ROSES-2010							
Swift Guest Investigator -- Cycle 7	29-Sep-10	21-Dec-10	83	182	61	34%	6%
Astrophysics Theory	4-Jun-10	21-Oct-10	139	193	33	17%	-1%
Origins of Solar Systems	28-May-10	19-Oct-10	144	36	6	17%	-14%
Astrophysics Data Analysis	14-May-10	2-Sep-10	111	186	63	34%	-10%
ROSES-10 INVESTIGATION TOTALS	weighted mean =		114	597	163	27%	
Core (Non-GO) solicitations				415	102	25%	
Guest Observer solicitations				182	61	34%	
ROSES-2009							
Astrophysics Research and Analysis	26-Mar-10	5-Aug-10	132	143	37	26%	-4%
Fermi Guest Investigator -- Cycle 3	5-Feb-10	12-May-10	96	182	77	42%	
Kepler Guest Observer - Cycle 2	22-Jan-10	19-Mar-10	56	54	27	50%	
Suzaku Guest Observer -- Cycle 5	20-Nov-09	29-Mar-10	129	88	47	53%	
MOST U.S. Guest Observer - Cycle 2	9-Oct-09	4-Feb-10	118	12	4	33%	
Swift Guest Investigator -- Cycle 6	30-Sep-09	12-Jan-10	104	169	47	28%	
GALEX Guest Investigator -- Cycle 6	19-Jun-09	23-Oct-09	126	81	33	41%	
Astrophysics Theory	29-May-09	21-Oct-09	145	200	36	18%	
Origins of Solar Systems (with Planetary Science Division)	22-May-09	5-Nov-09	167	29	9	31%	
Astrophysics Data Analysis	15-Jun-09	9-Oct-09	116	165	73	44%	
ROSES-09 INVESTIGATION TOTALS	weighted mean =		118	1123	390	35%	
Core (Non-GO) solicitations				537	155	29%	
Guest Observer solicitations				586	235	40%	

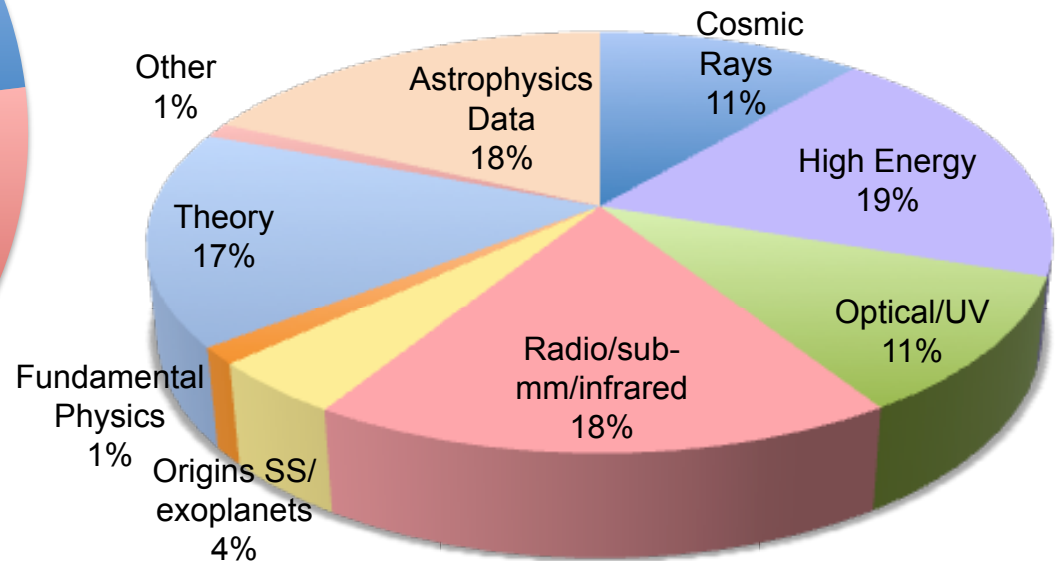


NASA Astrophysics Research Program FY10

Astrophysics Research \$122M



Research awards through ROSES \$74M





Modifications for ROSES-11 (18 February 2011)

D.2 **Astrophysics Data Analysis Program (ADAP)**: wording explicitly allows 'AISR' proposals for "development of tools for mining the vast reservoir of information locked within" the Astrophysics data archives.

D.3 **Astrophysics Research and Analysis Enabling Technology (now APRET)**: new name better describes program content: TRL1-3, up to TRL 6 for Explorers LISA technology now in SAT; Australia sounding rocket opportunities in 2014, 2016

D.4 **Astrophysics Theory (ATP)**: no substantial changes

D.8 **Fermi Guest Investigator**: explicit budget caps removed
Two-year proposals allowed, as introduced in ROSES-10

D.11 **Strategic Astrophysics Technology (SAT)**: mid-TRL for strategic missions
UV coatings added in COR program; expect changes as we respond to Astro2010

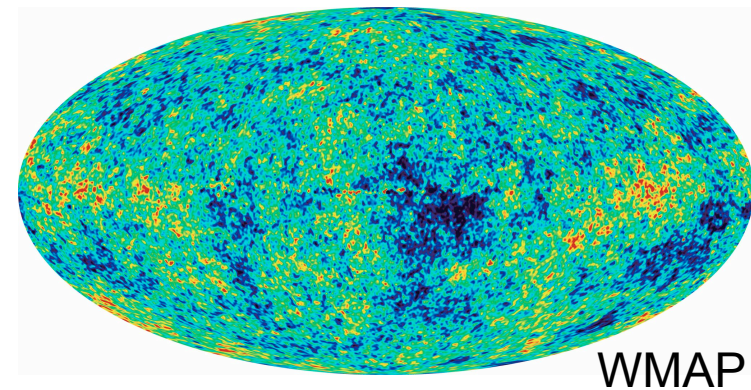
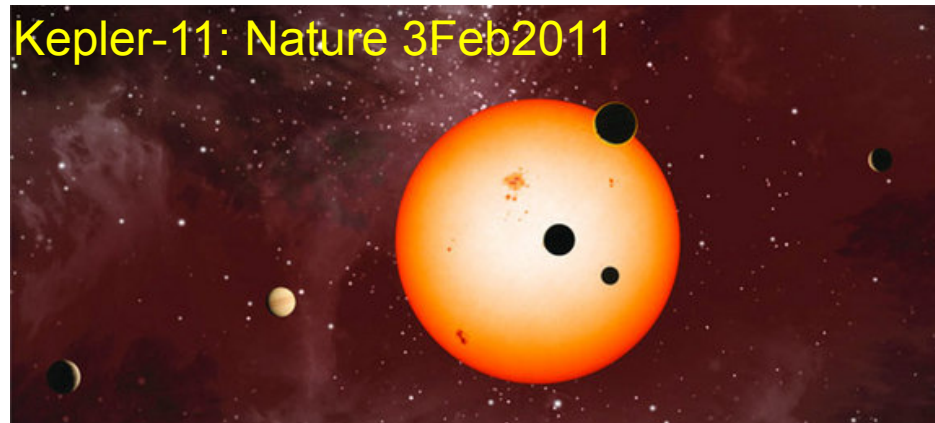
E.3 **Origins of Solar Systems**: exoplanet detection (only) in Astrophysics panels
Clarification: Planetary Major Equipment explicitly excluded from Astro proposals

E.7 **Conference Proposals**: Astrophysics will not participate for ROSES-11



Astro2010 Decadal Study Recommendations for Medium and Small Initiatives - 1

Develop technology for 'New Worlds' and 'Inflation Probe' missions
beyond 2020...

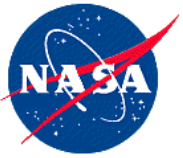


WMAP

and for future UV/optical capability
from space

Strategic Astrophysics Technology
(ROSES D.11) addresses mid-TRL
development for strategic missions



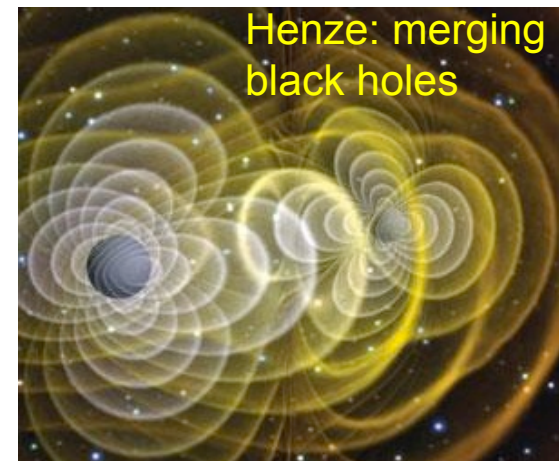


Astro2010 Decadal Study Recommendations for Medium and Small Initiatives - 2

- **25% more** suborbital flights: fast turn-round to enable science, develop technology and train future workforce (payload funding now ~\$25M/year)
- An **Intermediate Technology** program, filling the gap between 'blue skies' research and mission development: **\$15M/year by 2021**

Opportunities to develop young instrumentalists have declined...

- **25% increase** in Laboratory Astrophysics to interpret data from Herschel, JWST and other spectroscopic missions (now \$3M/year)
- **25% increase** in Astrophysics Theory (now \$12M/year)
- **Theory and Computation Networks**: joint NASA/NSF/DoE, **\$5M/year at NASA**. Multi-institutional computational and large-simulation efforts on major theoretical questions 'ripe for breakthrough within 5 years'





Response to Astro2010 Recommendations (budget figures are notional)

Program Scale	Recommendation	Recommended US Share	FY 2011 PBR	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	5-year total
Medium	New Worlds Tech Development	\$100-200	6.2	8.6	19.7	24.0	25.7	28.9	106.9
				2.4	13.5	17.9	19.6	22.7	76.1
Medium	Inflation Probe Tech Development	\$60-200	0.0	0.2	3.5	4.1	4.0	5.0	16.8
				0.2	3.5	4.1	4.0	5.0	16.8
Small	Astrophysics Theory Program Augmentation	+\$35M over 10 years	11.8	12.7	15.2	15.3	15.8	16.0	74.9
				0.9	3.4	3.5	3.9	4.2	15.9
Small	Definition of a future UV-optical space capability	\$40M over 10 years	0.4	0.1	3.0	3.6	3.6	3.7	13.9
				-0.3	2.6	3.2	3.2	3.3	11.9
Small	Intermediate Tech Dev Augmentation	+\$2M/yr, growing to +15M/yr in 2021	20.8	23.0	27.7	27.7	27.2	27.9	133.4
				2.2	6.9	6.9	6.4	7.1	29.6
Small	Laboratory Astrophysics	+\$2M/yr	3.2	3.5	4.7	4.7	5.0	5.0	22.9
				0.4	1.5	1.5	1.8	1.8	6.9
Small	SPICA	\$150M	Possible competed opportunity						
Small	Suborbital Program	+15M/yr	22.0	25.8	37.6	39.8	40.0	41.0	184.1
				3.8	15.6	17.8	18.0	19.0	74.3
Small	Theory and Computation Networks	+\$5M/yr NASA	0.0	0.5	3.0	3.1	3.1	4.0	13.7
				0.5	3.0	3.1	3.1	4.0	13.7

\$ in millions

Does not include civil servant labor

Top line: FY2012 PBR

Bottom line: augmentation above 2011



Astrophysics Research & Analysis and Suborbital Payloads (budgets notional)

(\$ in thousands, does not include civil servant labor)

	FY11 PBR	FY12	FY13	FY14	FY15	FY16
Research & Analysis	\$57,881	\$64,312	\$82,836	\$83,932	\$85,105	\$87,995
Suborbital payloads	21,964	23,779	29,604	30,803	30,992	31,958
Lab Astrophysics	3,193	3,544	4,692	4,692	4,957	5,016
Rest of APRA/APRET	20,751	22,966	26,657	27,690	27,152	27,892
Astrophysics Theory Program	11,805	12,723	15,178	15,274	15,751	15,982
Theory and Computation Networks		500	3,000	3,077	3,127	4,000
Technology Fellows		800	2,705	2,396	3,126	3,147

Large Suborbital (MO)		2,000	8,000	9,000	9,000	9,000
R&A Suborbital payloads	21,964	23,779	29,304	30,803	30,992	31,958
Total Suborbital Payloads		\$25,779	\$37,304	\$39,803	\$39,992	\$40,958

Astrophysics Data Analysis	\$14,132	\$16,957	\$18,457	\$18,937	\$19,466	\$19,832
-----------------------------------	-----------------	-----------------	-----------------	-----------------	-----------------	-----------------

Astrophysics Data Analysis Program is unchanged from FY11 budget request



Backups



Research Program Funding History

	FY04	FY05	FY06	FY07	FY08	FY09	FY10
Particle Astro	\$ 8,248,000	\$ 7,670,887	\$ 8,543,526	\$ 7,631,233	\$ 6,671,579	\$ 8,201,428	\$ 8,259,840
High Energy	\$ 14,548,000	\$ 13,693,202	\$ 14,779,227	\$ 12,781,980	\$ 12,405,649	\$ 13,886,226	\$ 14,110,293
UV/Opt/IR/ Sub-mm	\$ 20,409,000	\$ 18,742,126	\$ 21,850,678	\$ 17,442,434	\$ 19,094,421	\$ 22,353,194	\$ 21,534,307
Other	\$ 1,019,000	\$ 854,085	\$ 337,664	\$ 394,000	\$ 593,764	\$ 669,550	\$ 672,677
APRA Total	\$ 44,224,000	\$ 40,960,300	\$ 45,511,095	\$ 38,249,647	\$ 38,765,413	\$ 45,110,398	\$ 44,577,117
Orig Solar Systems	\$ 4,209,000	\$ 3,871,613	\$ 4,149,617	\$ 3,673,163	\$ 2,965,064	\$ 2,999,535	\$ 2,807,315
Astro Theory Program	\$ 7,860,000	\$ 7,363,285	\$ 10,245,457	\$ 10,227,007	\$ 11,695,838	\$ 11,890,067	\$ 12,261,568
R&A (399131)	\$ 56,293,000	\$ 52,195,198	\$ 59,906,169	\$ 52,149,817	\$ 53,426,315	\$ 60,000,000	\$ 59,646,000
ADAP/LTSA	\$ 16,986,000	\$ 15,700,000	\$ 15,188,960	\$ 12,640,683	\$ 12,013,000	\$ 14,383,900	\$ 13,258,126
Core R&A	\$ 73,279,000	\$ 67,895,198	\$ 75,095,129	\$ 64,790,500	\$ 65,439,315	\$ 74,383,900	\$ 72,904,126
TPF/FS	\$ 2,000,000	\$ 2,000,000		Foundation Science;			
Beyond Einstein FS	\$ 4,000,000	\$ 3,000,000	\$ 2,000,000	now in ATP			
ASMCS (399131)			Mission concept studies		\$ 3,451,685	\$ 442,100	
PCOS SR&T							\$ 967,609
TOTAL R&A	\$ 79,279,000	\$ 72,895,198	\$ 77,095,129	\$ 64,790,500	\$ 68,891,000	\$ 74,826,000	\$ 73,871,735
		\$7M R&A cut	smaller R&A cut	15% R&A cut	Partial recovery	More R&A recovery	



Panelists for Research Program Review

Jay	Gallagher	U Wisconsin	Chair; spectroscopy, galaxies, journal editor
John	Blondin	N Carolina State U	theory, supernova remnants, X-rays
Steve	Boggs	UC Berkeley	Balloon PI, gamma rays
Dennis	Ebbets	Ball Aerospace, Colorado	UV spectroscopy, exoplanets
Miriam	Forman	Stony Brook	particle acceleration: cosmic rays, solar wind
Tom	Greene	Ames, civil servant	exoplanets
Mary Beth	Kaiser	Johns Hopkins	Ap SubCttee, rocket PI
Tom	Lored	Cornell	LSST, astrostatistics
Amber	Miller	Columbia	CMB instrumentation
James	Neff	College of Charleston	X-ray, UV, stellar coronae (sabbatical 2010-11)
Joseph	Nuth	GSFC	dust, molecules (planetary)
Sterl	Phinney	Caltech	theory, fundamental physics
Howard	Smith	CfA, formerly at NASA HQ	IR spectroscopy
Chris	Walker	Arizona	hardware: far-infrared



Research Program Review: Timeline

First telecon meeting 13 December 1-3pm EST

Welcome, introductions, planning: decide what to do when.

First in-person meeting 9 January 2011 noon-5pm PST in Seattle

Presentations on Fermi Guest-Investigator program (Julie McEnery)
and Origins of Solar Systems (Mario Perez; Don Terndrup from NSF)

Public comment session 12 January 2011

Meeting in the DC area: 24-25 March 2011

Presentations from Hubble, Chandra, Spitzer Guest Observer programs
(to be confirmed) with info on plans for SOFIA;
from HQ discipline scientists on APRA, Astrophysics Theory, ADAP;
from HQ on Technology Roadmap plans from OCT

Meeting in the DC area: 28-29 April 2011

Writing the report; last-minute or forgotten items

Report due May 15, 2011